

**REMARKS**

This Amendment and Response is filed in reply to the final Office action dated February 21, 2008. Claims 18-19 are amended no claims are canceled. Accordingly, after entry of this Amendment and Response, claims 1-22 remain pending.

**I. Claim Rejections Under 35 U.S.C. § 101**

Claims 18-22 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. In response, claims 18-19 are amended to clarify that the sampling mechanism is implemented in hardware, i.e., physical "things." The Applicant respectfully submits that claims 18-22 define statutory inventions and respectfully requests withdrawal of the rejection.

**II. Claim Rejections Under 35 U.S.C. § 102**

Claims 1-22 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,000,044 to Chrysos et al. (hereinafter "Chrysos"). An anticipation rejection requires that each and every limitation of a claim be disclosed in a single prior art reference. See *MPEP* § 2131. This rejection is respectfully traversed because Chrysos is insufficient to anticipate all of the limitations of the claims as discussed in more detail below. Initially, the rejections of independent claims 1, 8, 14 and 18 are addressed.

**A. Rejection of independent claim 1**

Independent claim 1 includes the limitations "determining whether the sampling information includes an event of interest to a particular thread within which the instruction is executing" and "reporting the sampling information to the particular thread when the sampling information includes an event of interest." That is, once sampling information has been obtained for a selected instruction, a determination is made as to whether the sampling information contains an event of interest to a particular thread within which the instruction is executing and when the sampling information includes an event of interest, the sampling information is reported to the particular thread. Sampling information not of interest is discarded by the sampling mechanism. The Office action relies on Chrysos to teach these limitations. See *Office action*, page 5, citing column 15, lines 30-35, column 10, lines 5-19 and column 6, lines 60-65. The Applicant respectfully disagrees for the following reasons.

Chrysos, considered as a whole, discloses a sampling mechanism that randomly selects an instruction for sampling. The instruction may be filtered prior to being issued to the fetch unit. See *Chrysos*, column 5, lines 44-46 and Figure 5. That is, sampling information is gathered for a randomly selected instruction meeting certain pre-sampling filter criteria rather than determining whether the sampling information of the sampled instruction

includes an event of interest to a particular thread within which the instruction is executing as required by independent claim 1.

Further, in Chrysos, when the instruction finishes executing, the sample information is stored in a profile record. *See Chrysos, column 10, lines 5-19 and column 6, lines 60-66.* That is, in Chrysos, the sampling information is reported (stored) in a profile record rather than reporting the sampling information to the particular thread when the sampling information includes an event of interest as required by independent claim 1. Insofar as Chrysos does not disclose all of the limitations of independent claim 1, Chrysos is insufficient to anticipate independent claim 1 and such indication is respectfully requested.

#### **B. Rejection of independent claims 8 and 14**

Independent claim 8 includes the limitations "setting a candidate counter to a number," "decrementing the candidate counter when all events for the instruction have occurred and when the instruction corresponds to a desired sampled thread," "determining whether the candidate counter equals zero" and "reporting the instruction when the candidate counter equals zero." Independent claim 14 includes similar limitations. That is, a candidate counter is set to a number and is decremented each time all events for a sampled instruction occurs and the sampled instruction corresponds to a desired sampled thread. In essence, every nth sampled instruction of a thread may be reported.

The Office action relies on Chrysos to disclose these limitations. *See Office action, page 6, citing column 14, lines 64-67, column 15, lines 5-15 and Figure 2B.* The Applicant respectfully disagrees that Chrysos discloses all the limitations of claim 8. Chrysos discloses a counter that is decremented each time an instruction is fetched. When the counter overflows or underflows, the current fetched instruction is selected for sampling. *See Chrysos, column 14, line 64 to column 15, line 2.* Chrysos also discloses that the counter may be incremented every cycle instead of for each instruction fetched to count fetch opportunities. *See Chrysos, column 15, lines 5-8.* Thus, Chrysos discloses a counter that is decremented when an instruction is fetched or on every cycle rather than being decremented when all events for the instruction have occurred and when the instruction corresponds to a desired sampled thread, as required by independent claims 8 and 14. Insofar as Chrysos does not disclose all of the limitations of independent claims 8 and 14, Chrysos is insufficient to anticipate independent claims 8 and 14 and such indication is respectfully requested.

#### **C. Rejection of independent claim 18**

Independent claim 18 includes the limitation "wherein the sample filtering and counting logic is replicated on a per thread basis." The Office action relies on Chrysos to teach this limitation. *See Office action, page 10, citing column 26, lines 56-65 and Figure*

14B, item 1480. The Applicant respectfully disagrees that Chrysos discloses sample filtering and counting logic replicated on a per thread basis for the following reasons.

Chrysos discloses that threads may be scheduled according to processor utilization. This is done to determine an non-conflicting execution schedule. How each thread uses each class of resources in the processor (such as floating point units, memory units, branch units) may be determined using sampling. See *Chrysos*, column 26, lines 56-67. As such, Chrysos discloses thread utilization of processor resources may be determined using sampling. However, this is insufficient to disclose sample filtering and counting logic replicated on a per thread basis as required by independent claim 18. Insofar as Chrysos does not disclose all of the limitations of independent claim 18, Chrysos is insufficient to anticipate independent claim 18 and such indication is respectfully requested.

**D. Rejection of claims 2-7, 9-13, 15-17 and 19-22**

The remaining rejected claims 2-7, 9-13, 15-17 and 19-22 all depend, either directly or indirectly, from one of independent claims 1, 8, 14 and 18. Accordingly, these dependent claims are themselves patentable over Chrysos for at least the above state reasons, and such indication is respectfully requested. This statement is made without reference to or waiving the independent bases of patentability within each dependent claim.

**III. Conclusion**


The Applicant thanks the Examiner for his thorough review of the application. The Applicant respectfully submits the present application, as amended, is in condition for allowance and respectfully requests the issuance of a Notice of Allowability as soon as practicable.

This Amendment is submitted contemporaneously with a Request for Continued Examination. Accordingly, please charge Deposit Account No. 04-1415 in the amount of \$810.00, for a Request for Continued Examination fee. The Applicant believes no further fees or petitions are required. However, if any such petitions or fees are necessary, please consider this a request therefor and authorization to charge Deposit Account No. 04-1415 accordingly.

If the Examiner should require any additional information or amendment, please contact the undersigned attorney.

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Respectfully submitted,



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